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FOOD SOURCES and the NUTRITIONAL ROLE of *Sodium and Potassium*

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FOOD SOURCES AND THE NUTRITIONAL ROLE OF SODIUM AND POTASSIUM

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Sodium (Na) and chloride are two of the more than 15 mineral elements which people need for good nutrition. These two elements circulate in extracellular fluids, such as the blood vessels, and in tissues around the cells, although, potassium (K) is primarily found in the cells of muscles and in nerve tissues. An exception are fat cells, since they contain very little potassium. Sodium and potassium are important in the body's fluid balance and in performing other body functions. For example, sodium helps certain nutrients such as glucose to pass through the cell wall.

In normal circumstances and good health, the body regulates the amounts of sodium and potassium in the body so that a sodium: potassium ratio of 1:10 is maintained inside cells, compared to 28:1 ratio normally outside the cells. The kidney carefully regulates sodium and potassium levels in the body by excreting more when body levels are high. Therefore, recommendations often state that you should drink 6 to 8 glasses of fluids a day to maintain normal kidney functioning.

HOW MUCH SODIUM AND POTASSIUM DOES THE BODY NEED DAILY?

2,500 milligrams (2.5 grams) of potassium will usually meet daily potassium needs. About 3,000 to 5,000 milligrams (3 to 5 grams) of sodium daily is recommended by the Senate Select Committee on Nutrition (1977). This means an intake of 8 to 13 grams of salt, that is a reduction of 50 percent from what most Americans currently consume. In general, without addition of extra salt to the food served, the diet provides about 2 to 3 grams of sodium. The recommended food pattern from the Basic Four Food Guide provides about a half gram (500 milligrams) of sodium if preparation does not include added sodium from salt, soy sauce, Accent, patis, and bagoong.

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IS MUCH SODIUM OR POTASSIUM LOST IN PERSPIRATION?

Normally, only a small amount of sodium and potassium is lost in perspiration. However, the body may lose a greater amount in heavy perspiration produced by a hot climate, heavy physical activity, or a high fever. In such circumstances, the body adapts after a few days so less sodium and potassium are lost in perspiration. In unadapted individuals, the need for additional water and salt may be somewhat higher than in fully acclimated persons. Normally, foods will provide ample sodium to replace body losses. Water deprivation during sports and heavy exercise is harmful and can be fatal. Fluid intake before and during exercise will ensure peak performance ability.

CAN WEIGHT BE "SWEATED OFF?"

"Sweating off" weight for sports classifications or weight loss induces stress on the body and can be harmful. Such practices usually result in poor performance, can be detrimental in the growing years, and can be hazardous to health, even fatal. Drinking fluids will quickly restore the water loss. Rather than losing weight through water and salt restrictions, caloric intake should be modified so that one or two pounds is lost weekly until the desired weight is reached.

SHOULD SODIUM OR POTASSIUM BE RESTRICTED IN THE DIET?

Researchers have estimated an average ~~sodium~~ salt intake of 6 to 18 grams a day in the United States. This could be reduced but a person should not decide upon a rigid restriction of sodium or potassium which could be dangerous. Your physician will prescribe a sodium or potassium modified diet when it is necessary. Dehydration from vomiting and diarrhea over a long period of time causes a great loss of body fluids. Dehydration is usually a temporary condition, however, such as when children swallow household chemicals and become very nauseated. In such cases, the loss of potassium and sodium will need to be replaced.

WHAT SALTS CAN BE USED WITH DIURETICS?

Diuretics or "water pills" help the body to lose water. They should be used only when prescribed by a physician. Daily use of diuretics often causes a potassium deficiency. A person with low potassium levels will feel very tired and weak. A potassium supplement may be prescribed by the physician or foods can be selected for their potassium content.

It is best to check with a physician as to which salts or supplements are recommended for a particular diet.

WHAT FOODS CONTAIN SODIUM?

Table salt (sodium chloride) is about 40 percent sodium and 60 percent chloride. An intake of 10 grams of table salt (about 2 teaspoons) would contain about 4 grams of sodium each day. People of Hawaii, especially Orientals, tend to consume higher amounts of sodium because the seasoning they use has a high sodium content.

It is advisable to read the labels of processed foods. Label information may use the word sodium, the chemical symbol Na, or the word salt. Monosodium glutamate (MSG or the brand name Accent or Ajinomoto), baking powder, and brines, such as those used for pickles, sodium benzoate, and sodium proprionate, all contain sodium. Spiced or salted fish, luncheon meat, spiced sauces (such as soy sauce, bagoong sauce, A-1 sauce, or catsup), foods such as pretzels, potato chips, crackers, bouillon cubes or granules, preserved seeds, and nuts are generally highly salted.

Check labels of canned, frozen or dried foods, and cereals to see if salt has been added. Puffed rice, puffed wheat, shredded wheat, and cooked cereals are usually low in sodium content.

For a baking powder substitute, use potassium bicarbonate instead of sodium bicarbonate. Since the potassium baking powders are fast acting leavening agents, quick breads will need to be baked as soon as they are mixed. If a diet is greatly restricted in sodium and potassium, baking powder may need to be eliminated. Alternatives for leavening might be yeast or sour dough, or the choice of a recipe that leavens by incorporating air through beating. An example might be recipes with egg whites beaten separately such as pancakes or waffles.

Hard water usually has a lot of minerals. Commercial water softeners exchange sodium for these minerals. A person on a restricted sodium diet of 1,000 mgs. or less usually does not need to use softened water.

Avoid salt in bought and in homemade baby foods. Do not salt baby foods to your taste since babies do not taste salt and will eat unsalted food as readily as salted foods. Babies will obtain all the sodium they need from the sodium which occurs naturally in foods. Commercial companies have reduced the use of salt in canned baby foods. If you make baby food at home from family foods, do not add seasonings until the baby's portion is removed.

Many toothpastes, laxatives, antacids and medicines contain sodium.

WHAT FOODS CONTAIN POTASSIUM?

Certain foods from each of the food groups are good sources of potassium. Dried dates, bananas, cantaloupes, apricots, and citrus fruits are outstanding sources of potassium. Fats and vegetable oils contribute little or no potassium to the diet. In fact, almost all foods, whether fish, fowl, vegetables, or fruits, contain more potassium than sodium in their natural state. It is during food preparation or processing that human intervention reverses the natural levels of potassium and sodium by adding sodium products to foods.

Potassium is soluble in water. When foods are pared and boiled in a small amount of water, about one-fourth or more of the potassium is lost in the cooking water. The greater the amount of water or the longer the cooking time, the more potassium will be lost in cooking. However, if the cooking liquid is used, this is not a problem.

Special drink formulas for extra potassium are not necessary for athletes. Selection of food for potassium content should be ample to replace the body's potassium losses.

SODIUM, POTASSIUM, AND CALORIES IN CERTAIN FOODS

Food	Household Measure	Sodium mg	Potassium mg	Food Energy calories
MILK				
buttermilk	1 cup	318	342	88
evaporated reconstituted	1 cup	148	380	170
nonfat dry solids	1 cup	358	1173	244
skim, fluid	1 cup	128	356	90
whole	1 cup	122	352	160
yogurt (from partially skimmed)	1 cup	125	350	113
ice cream (10% fat)	1 cup	84	241	257
ice milk (5.1% fat)	1 cup	89	255	199
CHEESE				
cottage, creamed	1 cup	500	185	230
cheddar, American	1 slice	168	20	96
VEGETABLES**				
asparagus	4 med. spears	1	110	12
beans, green snap or wax	½ cup	3	120	16

Food	Household Measure	Sodium mg	Potassium mg	Food Energy calories
bean sprouts	½ cup	2	114	15
beets	½ cup	36	177	27
beet greens, cooked	½ cup	130	332	24
broccoli	2/3 cup (1 lg. stalk)	10	267	26
brussel sprouts	4	8	229	30
burdock root (Gobo)	1 cup, sl.	75	49	118
cabbage, shredded	½ cup	7	80	10
cabbage, Chinese	½ cup	10	80	5
cauliflower	½ cup	6	129	15
carrots	1 large	34	246	30
celery	1 small inner stalk	25	57	3
collards, cooked	½ cup	43	250	30
corn	½ cup	1	135	70
cucumbers	6½ inches	10	272	25
dandelion greens, cooked	½ cup	23	122	20
eggplant	½ cup diced	1	150	20
kim chee	2/3 cup	680	153	20
lettuce, Iceberg	¼ head	12	236	18
mushrooms, raw	10 small or 4 large	15	300	28
mustard greens, cooked	½ cup	14	150	15
onions, sliced	½ cup	6	90	22
parsnips, cooked, diced	½ cup	6	293	50
peas	½ cup	1	157	67
peppers, green or red	1 shell–2½" diameter	10	157	22
potato	1–2¼ inch	3	390	76
pumpkin, canned	½ cup	2	294	38
radishes	5 medium	4	72	4
sauerkraut, drained solids***	½ cup	877	164	20
seaweed	1 cup	196	1776	+
spinach, cooked	½ cup	45	290	21
squash				
summer, cooked	½ cup	1	127	14
winter, cooked	½ cup	1	316	50
zucchini	½ cup	1	127	10

Food	Household Measure	Sodium mg	Potassium mg	Food Energy calories
sweet potato	1 small (3"x2")	15	367	170
tomato juice, canned	½ cup	243	276	23
tomato	1 small	3	244	20
FRUIT**				
apple	1–2" or ½ c. juice	2	110	58
applesauce, unsweetened	½ cup	2	95	41
apricots, fresh	2–3 medium	1	278	51
apricot nectar	2/5 cup	trace	190	71
banana	1–7 inch	1	370	85
blackberries, blueberries or raspberries	½ cup	1	124	42
cantaloupe	¼ of 5 inch	16	332	20
cherries, raw or waterpack	½ cup	1	98	40
cranberry sauce	½ cup	1	40	200
dates	1 medium	trace	50	27
fig, raw	1 medium	1	97	40
grapefruit	½ medium or ½ c. juice	1	135	41
grapes, concord (red)	10 medium	1	42	18
grapes, seedless	10 medium	2	87	35
honeydew melon	¼ of 6½ inch	45	940	126
lemon or lime	1 medium	1	102	20
mango	1 medium	5	363	152
orange	1–2½ inch or ½ c. juice	1	200	50
papaya	½ medium	6	252	55
peach	1 medium	1	200	40
pear	½ medium	2	100	50
pineapple	1 raw slice or 1/3 c. juice	1	123	44
plums	1 medium	1	63	20
prunes, dried	2 medium	2	150	55
raisins, seedless	1 tablespoon	3	76	29
rhubarb, cooked, sweetened	½ cup	2	274	190
strawberries, whole	½ cup	1	122	25
tangerine	1 large (2½ inch)	2	127	46

Food	Household Measure	Sodium mg	Potassium mg	Food Energy calories
watermelon	½ cup	1	80	26
lychee	1 medium	0	20	6
BREADS AND CEREALS				
biscuit***	1–2 inch	272	32	91
bread, white or wheat***	1 slice	142	29	76
cereal				
farina, grits, cream of wheat, oatmeal, rolled wheat**	½ cup cooked	1	11	98
puffed rice or puffed wheat	½ cup	1	25	27
shredded wheat*	1 biscuit	1	70	71
cornbread***	1–2½ inch square	490	122	161
cornstarch	1 tablespoon	trace	trace	29
flour, wheat, white	1 tablespoon	trace	8	29
long rice (mung bean uncooked)	1 pk. (2 oz.=57 g)	2	79	194
macaroni, cooked** (noodles)	1 cup	1	85	150
miso	1 tablespoon	710	22	50
muffin***	1–average	176	50	118
noodles, cooked** (egg noodles)	1 cup	3	70	200
pancakes***	1–4 inch	115	33	62
poi	1 cup	27	439	161
popcorn, popped**	1 cup	trace	–	23
rice, brown or white**	½ cup cooked	.6	50	100
roll, hamburger or hot dog	1	202	38	119
saimin*	1 cup	666	459	188
spaghetti, cooked** (noodles)	1 cup	1	103	192
tapioca, dry	1 tablespoon	trace	2	36
waffle***	1–2 inch dia.	356	109	209
MEAT AND MEAL ALTERNATES**				
beans, dried, cooked*	½ cup	7	374	110
beef	3 oz.	45	210	275
beef tongue	3 oz.	50	140	176
chicken, turkey	3 oz.	90	400	184
duck	3½ oz.	82	–	326
egg	1 medium	59	57	78
frankfurter	1 (2 oz.)	627	125	176

Food	Household Measure	Sodium mg	Potassium mg	Food Energy calories
kidney, raw (all kinds)	½ cup	176	227	176
lamb, cooked lean	2 oz.	60	273	158
lentils, dried, cooked*	1 cup	–	498	212
liver (beef)	3 oz.	156	323	195
luncheon meat/bologna*	1 oz.	**	**	75
peanut butter, salted	1 tablespoon	97	100	94
peanut butter, unsalted	1 tablespoon	18	123	94
peanuts, roasted with skin**	10 nuts	trace	127	105
pork				
fresh ham, cooked	3 oz.	47	214	300
cured	3 oz.	637	199	240
sausage, Chinese and Portuguese	3½ oz.	1500	300	350
tofu, soybean curd	1 block	85	420	288
FISH**				
caviar, sturgeon	1 tablespoon	352	29	50
clams	4 or 5	144	218	56
cod	2½ oz.	70	265	111
crab, steamed	½ cup	675	75	68
fish cake, steamed	3½ oz.	1060	128	200
flounder	3 oz.	201	498	79
haddock (raw)	3½ oz. (=100 g)	61	304	79
halibut, Atlantic or Pacific	3 oz.	120	450	150
lobster, Northern	2½ oz. or ½ cup	150	130	64
mackerel, Atlantic or Pacific	3 oz.	172	4	153
mahimahi	3½ oz.	120	267	100
ocean perch, Atlantic	3 oz.	129	243	192
oysters, fresh	2 or 3	21	34	19
rockfish	3 oz.	60	378	90
salmon, steak	3½ oz.	99	378	150
salmon, Atlantic, canned	3 oz.	351	327	128
sardines, canned in oil, drained	1 fish	100	75	30
scallops	3 oz.	240	432	100
shad	3 oz.	66	321	170
shrimp	10 medium	53	65	37
tuna (packed in oil)	½ cup, drained	37	250	140

Food	Household Measure	Sodium mg	Potassium mg	Food Energy calories
MISCELLANEOUS				
bacon, broiled	2 slices	153	35	86
butter, salted (reg.)	1 tablespoon	140	3	102
butter, unsalted	1 tablespoon	trace	3	102
catsup	1 tablespoon	156	54	18
cream, coffee	1 tablespoon	6	18	32
cream, sour	1 tablespoon	6	–	57
margarine, fortified (reg.)	1 tablespoon	140	3	102
mayonnaise	1 tablespoon	84	5	101
mustard, prepared	1 teaspoon	65	7	4
olives				
green	2 medium	312	7	15
ripe	3 large	150	8	30
pickles, dill	1–4 inch	1928	270	15
sugar, granulated	1 tablespoon	trace	trace	45
syrup, honey, jelly, jam and marmalade	1 tablespoon	0	15	60
vegetable oil	1 tablespoon	0	0	126
salad dressing	1 tablespoon	92	4	88
salt (sodium chloride)	1 level teaspoon	2300	0	0
monosodium glutamate (MSG)	1 level teaspoon	750	0	0
baking soda	1 level teaspoon	1000	0	0
baking powder	1 level teaspoon	370	5	3
soy sauce	1 level tablespoon	900	30	0

* Read the label since brands vary on sodium content
** Cooked without salt added
*** Prepared with salt and/or baking powder
\+ Uncertain how well carbohydrate is utilized

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